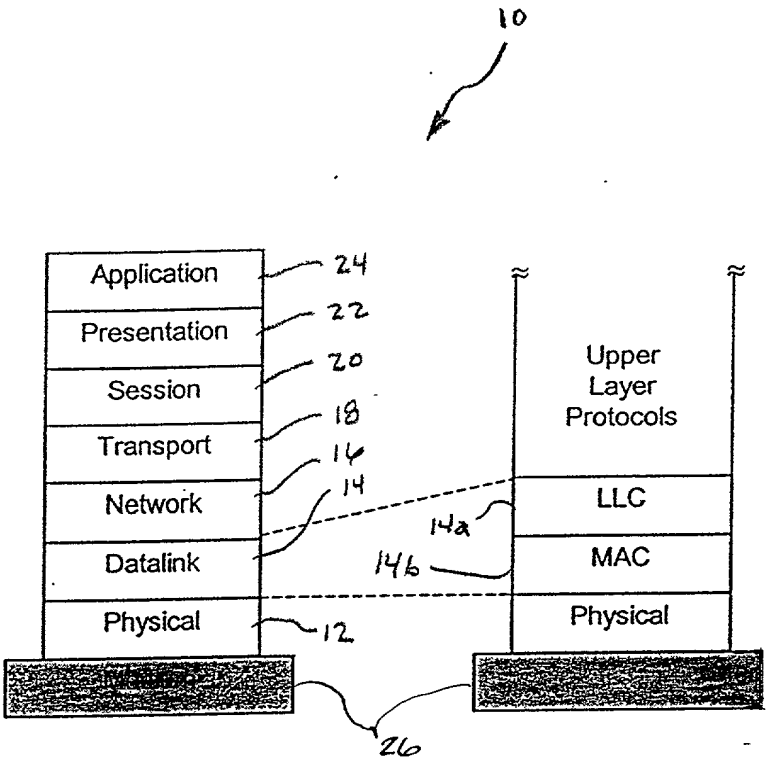
10
Application
Presentation
Session
Transport
Network
Datalink
Physical
24
22
20
18
16
14
12
Upper
Layer
Protocols
LLC
MAC
Physical
14a
14b
26

Figure 1

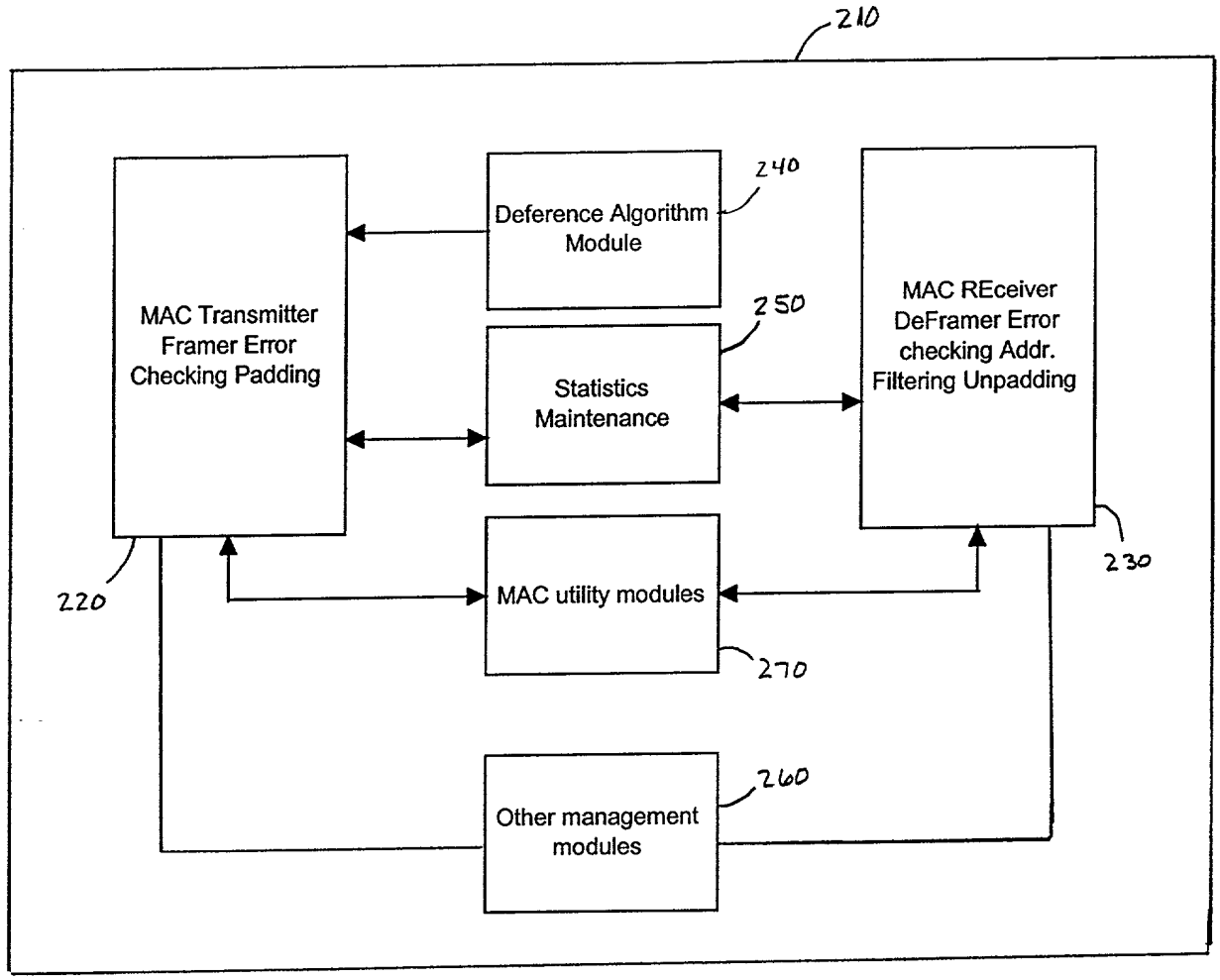
210
MAC Transmitter Framer Error Checking Padding
220
Deference Algorithm Module
240
Statistics Maintenance
250
MAC REceiver DeFramer Error checking Addr. Filtering Unpadding
230
MAC utility modules
270
Other management modules
260

Figure 2

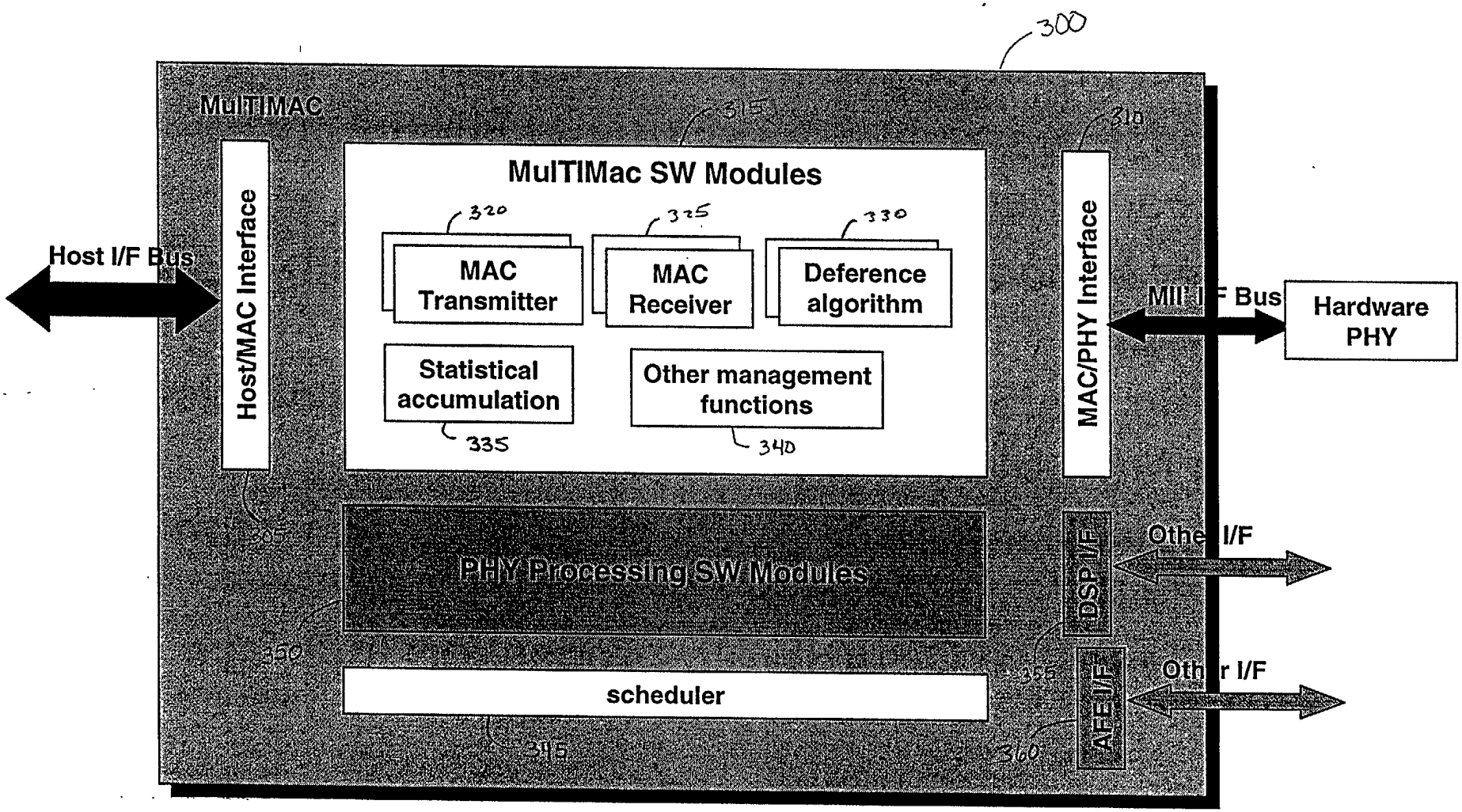
300
MulTIMAC
315
MulTIMac SW Modules
310
320
325
330
Host I/F Bus
Host/MAC Interface
MAC Transmitter
MAC Receiver
Deference algorithm
MAC/PHY Interface
MII I/F Bus
Hardware PHY
Statistical accumulation
335
Other management functions
340
305
PHY Processing SW Modules
DSP I/F
Othe I/F
350
355
AFE I/F
Oth r I/F
scheduler
345
360

Figure 3

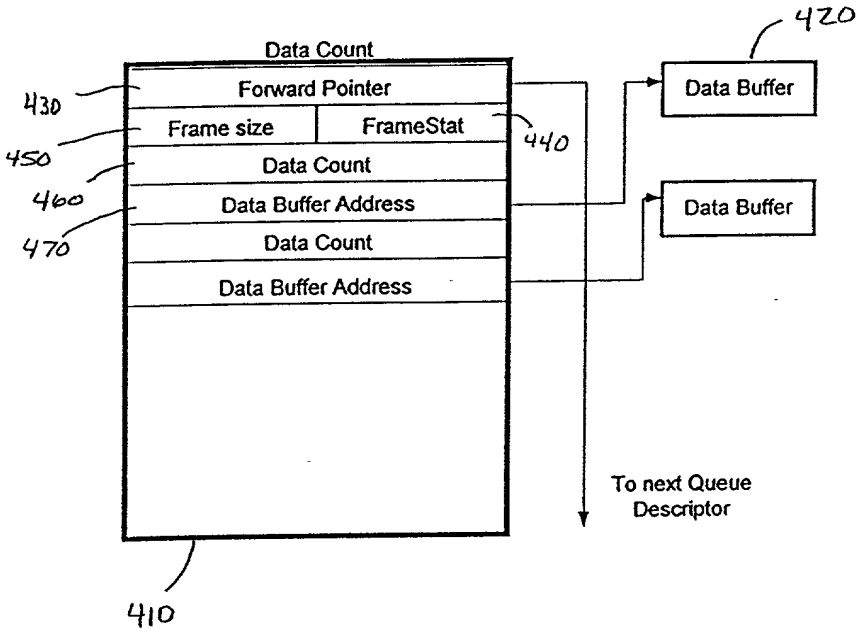
Data Count
Forward Pointer
Frame size
FrameStat
Data Count
Data Buffer Address
Data Count
Data Buffer Address
Data Buffer
Data Buffer
To next Queue Descriptor
420
430
440
450
460
470
410

Figure 4

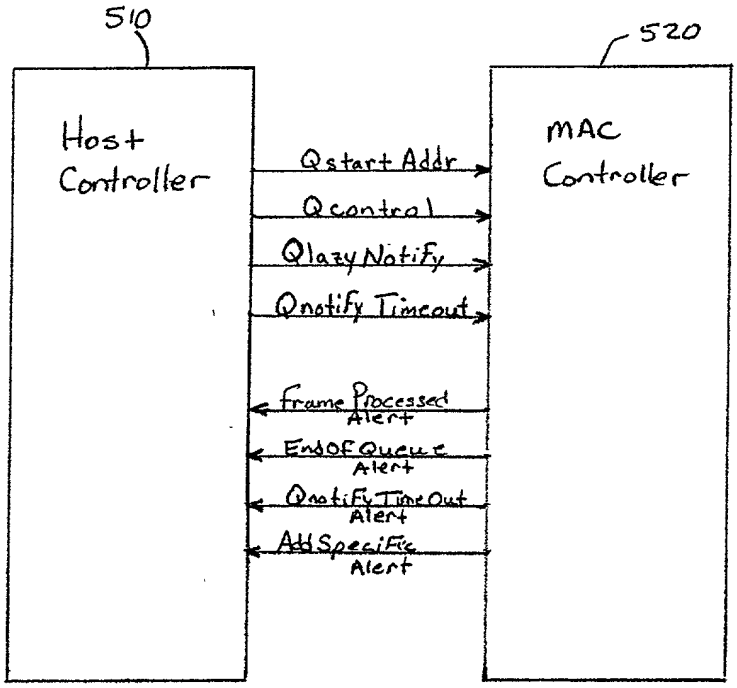
510
520
Host Controller
MAC Controller
Qstart Addr
Qcontrol
QlazyNotify
Qnotify Timeout
Frame Processed Alert
End Of Queue Alert
Qnotify Time Out Alert
Add Specific Alert

Figure 5

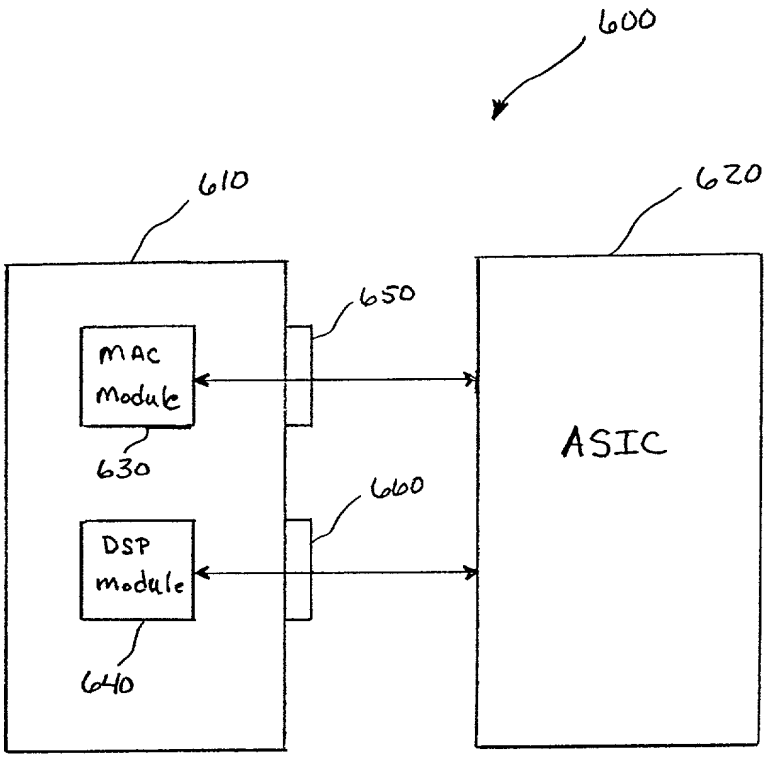

Figure 6

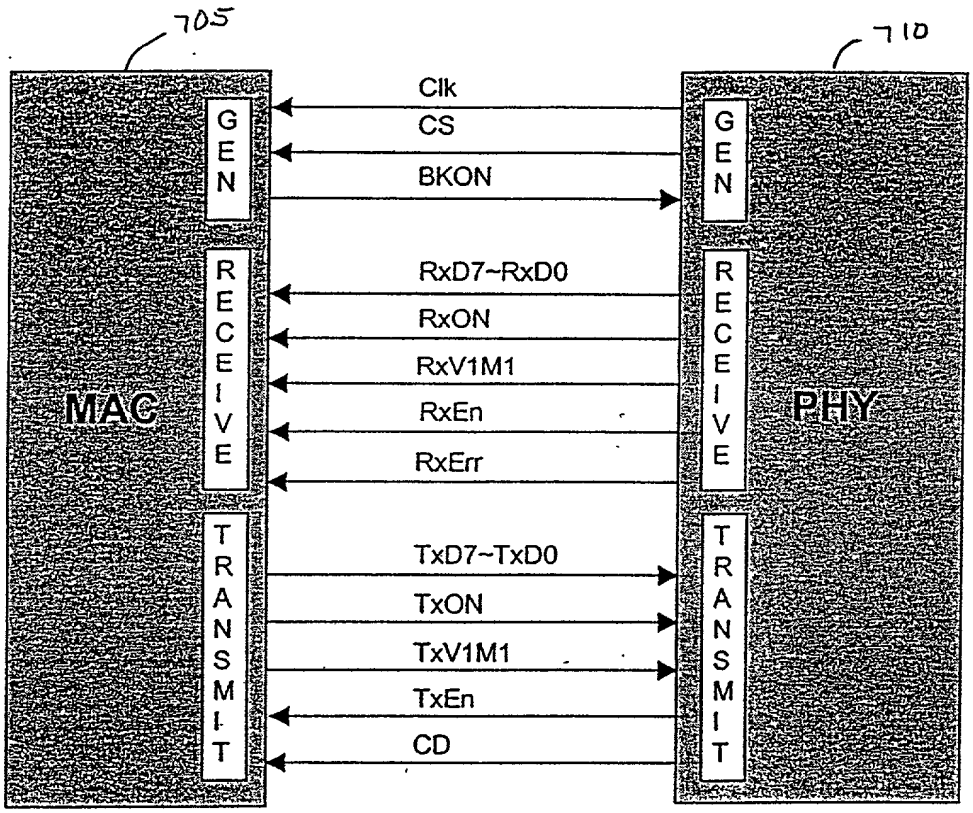
705
710
MAC
PHY
GEN
RECEIVE
TRANSMIT
Clk
CS
BKON
RxD7~RxD0
RxON
RxV1M1
RxEn
RxErr
TxD7~TxD0
TxON
TxV1M1
TxEn
CD

Figure 7

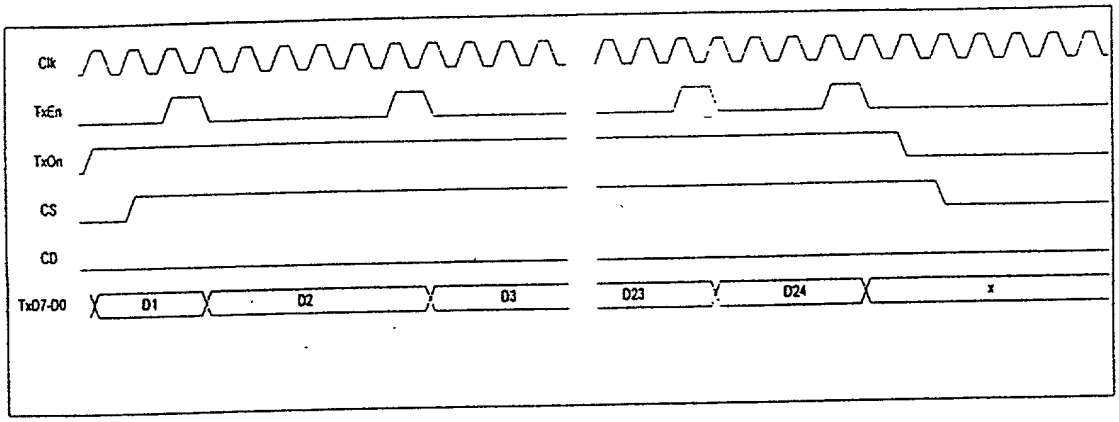

Figure 8

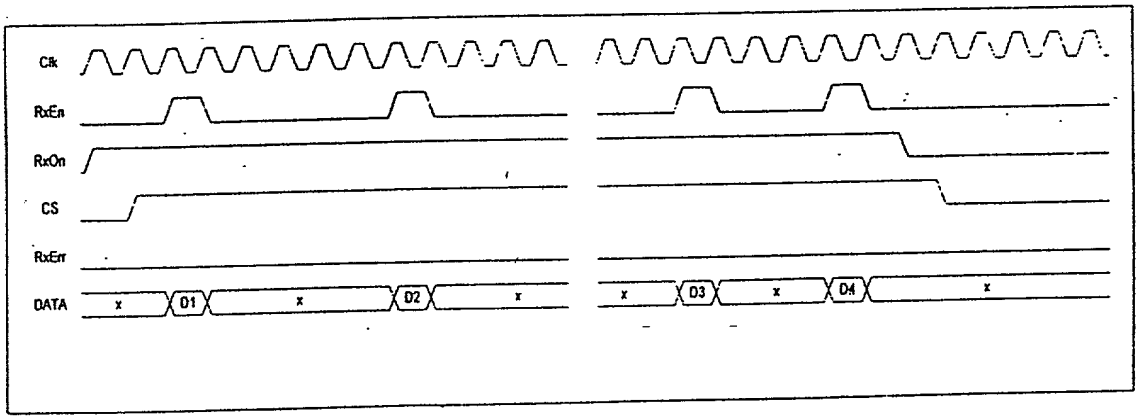

Figure 9

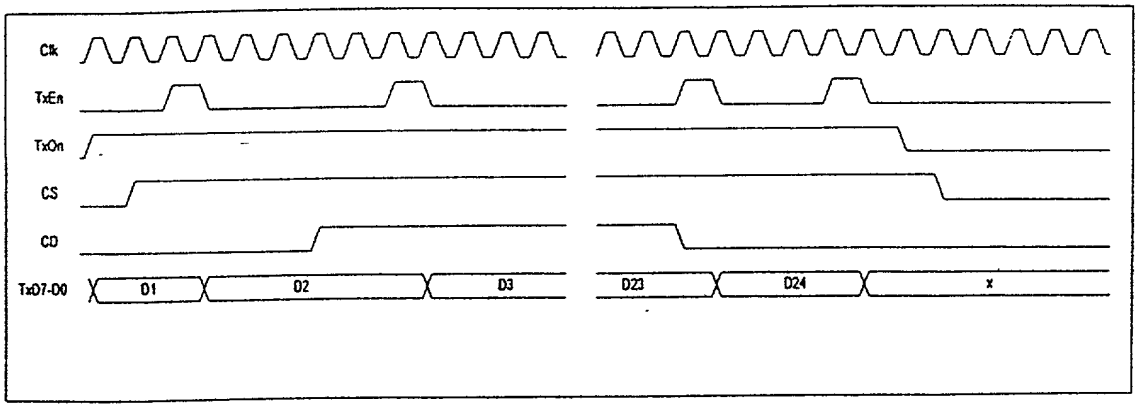

Figure 10

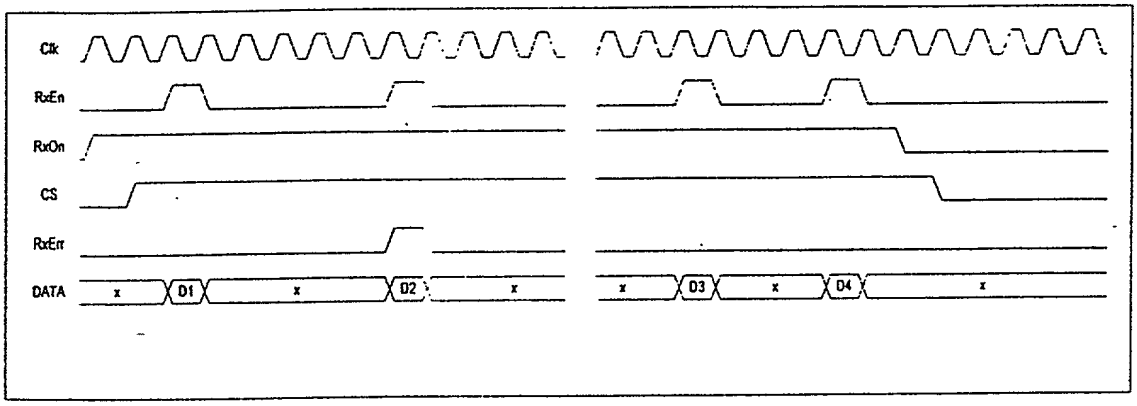

Figure 11

Register Address	Register Name	Description	R/W	Implementation
0	Tx address register	TxFrame start address	MAC write	MAC
1	Tx length register	TxFrame length	MAC write	PHY
2	Rx address register	RxFrame start address	MAC write	MAC
3	Rx length register	RxFrame length	MAC read	PHY
4	control register	frame transmit and receive control register	MAC write	MAC
5	status register	PHY signaling status	MAC read	MAC
6	interrupt mask register	PHY to MAC interrupt masks	MAC write	MAC
7	interrupt status register	Interrupt status	MAC read	MAC
8	CRC32 high register	CRC32 High 16 bits	MAC read	PHY
9	CRC32 low register	CRC32 Low 16 bits	MAC read	PHY
10	CRC16 register	CRC16	MAC read	PHY
11	PHY management control register	described in 5.	Host/MAC write	PHY
12	PHY management status register	described in 5.	Host/MAC read	PHY

Figure 12

Bits	Name	Description	R/W
15	TxON	1 = set TxON signal 0 = clear TxON signal	R/W
14	BkON	1 = set BkON signal 0 = clear BkON signal	R/W
13	TxV1M1	1 = set TxV I M 1 signal 0 =clear TxV I M I signal	R/W
12 ~ 8	Reserved	Write as 0, ignore on Read	R/W
7	Interrupt enable	1 = PHY Interrupts are globally enabled 0 = PHY interrupts are globally enabled	R/W
6 ~ 0	Reserved	Write as 0, ignore on Read	R/W

Figure 13

Bits	Name	Description	R/W
15	TxON	1 = TxON signal is asserted 0 = TxON signal is not asserted	R
14	BkON	1 = BkON signal is asserted 0 = BkON signal is not asserted	R
13	TxV1M1	1 = TxV I M I signal is asserted 0 = TxV I M I signal is not asserted	R
12	RxON	1 = RxON signal is asserted 0 = RxON signal is not asserted	R
11	CS	1 = CS signal is asserted 0 = CS signal is not asserted	R
10	CD	1 = CD signal is asserted 0 = CD signal is not asserted	R
9	RxV1M1	1 = RxV1M1 signal is asserted 0 = RxV1M1 signal is not asserted	R
8	RxErr	1 = RxErr signal is asserted 0 = RxErr signal is not asserted	R
7	Interrupt enable	1 = PHY interrupts are globally enabled 0 = PHY interrupts are globally disabled	R
6 ~ 0	Reserved	ignore on Read	R

Figure 14

Bits	Name	Description	R/W
15	CS_ON enable	1 = enable interrupt when CS signal becomes asserted 0 = disable CS_ON interrupt	R/W
14	CS_OFF enable	1 = enable interrupt when CS signal becomes de-asserted 0 = disable CS_OFF interrupt	R/W
13	CD_ON enable	1 = enable interrupt when CD signal becomes asserted 0 = disable CD_ON interrupt	R/W
12	RxON_ON enable	1 = enable interrupt when RxOn signal becomes asserted 0 = disable RxON+ON interrupt	R/W
11	RxON_BkON enable	1 = enable interrupt when RxOn signal becomes asserted during the backoff slots 0 = disable RxON_BkOn interrupt	
10	RxErr_ON enable	1 = enable interrupt when RxErr signal becomes asserted 0 = disable RxErr+ON signal	R/W
9	PHY RxFifo Overrun enable	1 = enable interrupt when PHY's receive fifo overrun 0 = disable the interrupt	R/W
8	PHY TxFifo Underrun Enable	1 = enable interrupt when PHY's transmit fifo is underrun 0 = disable the interrupt	R/W
7	PHY Sample Data Ready Enable	1 = enable interrupt when PHY's sample data is ready for DSP processing 0 = disable the interrupt	R/W
6	PHY Log Data Ready	1 = enable interrupt when PHY's log data is ready for DSP/Host to sample 0 = disable the interrupt	R/W
5~0	Reserved	Initialized with 0 and ignore on Read	R/W

Figure 15

Bits	Name	Description	R/W
15	CS_ON	1 = interrupt of CS signal becomes asserted has been generated 0 = CS_ON interrupt is not generated	R
14	CS_OFF	1 = interrupt of CS signal becomes asserted has been generated 0 = CS_OFF interrupt is not generated	R
13	CD_ON	1 = interrupt of CD signal becomes asserted has been generated 0 = CD_ON interrupt is not generated	R
12	RxON_ON	1 = interrupt of RxON_ON signal becomes asserted has been generated 0 = RxON_ON interrupt is not generated	R
11	RxOn_Bk ON	1 = interrupt of RxOn signal becomes asserted during the back off slots has been generated 0 = RxON_BkON interrupt is not generated	R
10	RxErr_ON	1 = an interrupt of RxErr signal becomes assertedhas been generated 0 = RxErr ON interrupt is not generated	R
9	PHY RxFifo Overrun	1 = an interrupt of PHY's receive fifo overrun has been generated 0 = this interrupt is not generated	R
8	PHY TxFifo Underrun	1 = an interrupt of PHY's transmit fifo is underrun has been generated 0 = this interrupt is not generated	R
7	PHY Sample Data Ready	1 = an interrupt of PHY's sample data is ready for DSP processing has been generated 0 = this interrupt is not generated	R
6	PHY Log Data	1 = an interrupt of PHY's log data is ready for DSP/Host to sample 0 = this interrupt is not generated	R
5 ~ 0	Reserved	ignore on Read	R

Figure 16

Bits	Name	Description	R/W
15	Reset	1 = PHY reset	R/W
14	Loopback	1 = enable loopback mode 0 = disable loopback mode	R/W
13	Baudrate Selection	1 = 4Mbaud supported 0 = 4Mbaud not supported	R/W
12, 11	Mode selection	0 0 = 2.0 Mode 0 1 = 1.0 Mode 1 0 = Compatibility Mode 1 1 = Mode automatic selection	R/W
10	Collision Test	1 = enable CD signal test 0 = disable CD signal test	R/W
9	Power Mode	1 = Low power state 0 = normal power state	R/W
8:0	Reserved	Write as 0, ignore on Read	R/W

Figure 17

Bits	Name	Description	R/W
15	Reserved	Write as 0, ignore on Read	R
14	Loopback	1 = PHY is in loopback mode 0 = PHY is not in loopback mode	R
13	Baudrate Selection	1 = PHY supports 4Mbaud 0 = PHY does not support 4Mbaud	R
12, 11	Mode status	0 0 = PHY is in 2.0 only Mode 0 1 = PHY 1.0 only Mode 1 0 = PHY is in Compatibility Mode 1 1 = PHY is in automatic selection mode	R
10	Reserved	Write as 0 ignore on Read	R
9	Power Mode	1 = PHY is in Low power state 0 = PHY is in normal power state	R
8:0	Reserved	Write as 0, ignore on Read	R/W

Figure 18

Register Index	Register Name	Description	R/W	Implementation
0	TxFrame length	Byte count of frame transmitted from MAC to PHY	PHY read	PHY
1	RxFrame length	Byte count of frame transmitted from PHY to MAC	PHY write	PHY
2	Signal control	MAC/PHY interface signal control register	PHY write	PHY
3	Signal status	MAC/PHY signaling status	PHY read	PHY
4	CRC32 high register	CRC32 High 16 bits	PHY write	PHY
5	CRC32 low register	CRC32 Low 16 bits	PHY write	PHY
6	CRC16 register	CRC16	PHY write	PHY
7	PHY management control register	described in 5.0	PHY read	PHY
8	PHY management status register	described in 5.0	PHY write	PHY

Figure 19

Bits	Name	Description	R/W
15	RxON	1 = set RxON signal 0 = clear RxON signal	R/W
14	RxV1M1	1 = set RxV1M1 signal 0 = clear RxV1M1 signal	R/W
13	CS	1 = set CS signal 0 = clear RX signal	R/W
12	CD	1 = set CD signal 0 = clear CD signal	R/W
11	RxErr	1 = set RX signal 0 = clear RxErr signal	R/W
10 ~ 0	Reserved	Write as 0, ignore on Read	R/W

Figure 20

Register Index	Register Name	Description	R/W	Implementation
0	Sample data address	Sample data buffer start address	DSP write	DSP
1	Sample data length	The number of data bytes need to be transferred from the PHY	DSP write	DSP
2	Rx Sample data length	The number of data words (16 bit) actually transferred from the PHY	DSP read	PHY
3	DSP data length	The number of data words (16 bit) actually transferred from the PHY	DSP read	PHY
4	DSP data port	DSP data output port	DSP write	DSP

Figure 21

Register Index	Register Name	Description	R/W	Implementation
0	Rx Sample data length	The number of data words (16 bit) actually transferred from the PHY to the DSP	PHY write	PHY
1	DSP data length	The number of data bytes needed to be transferred to the PHY	PHY read	DSP
2	DSP data port	DSP data input port	PHY read	PHY

Figure 22

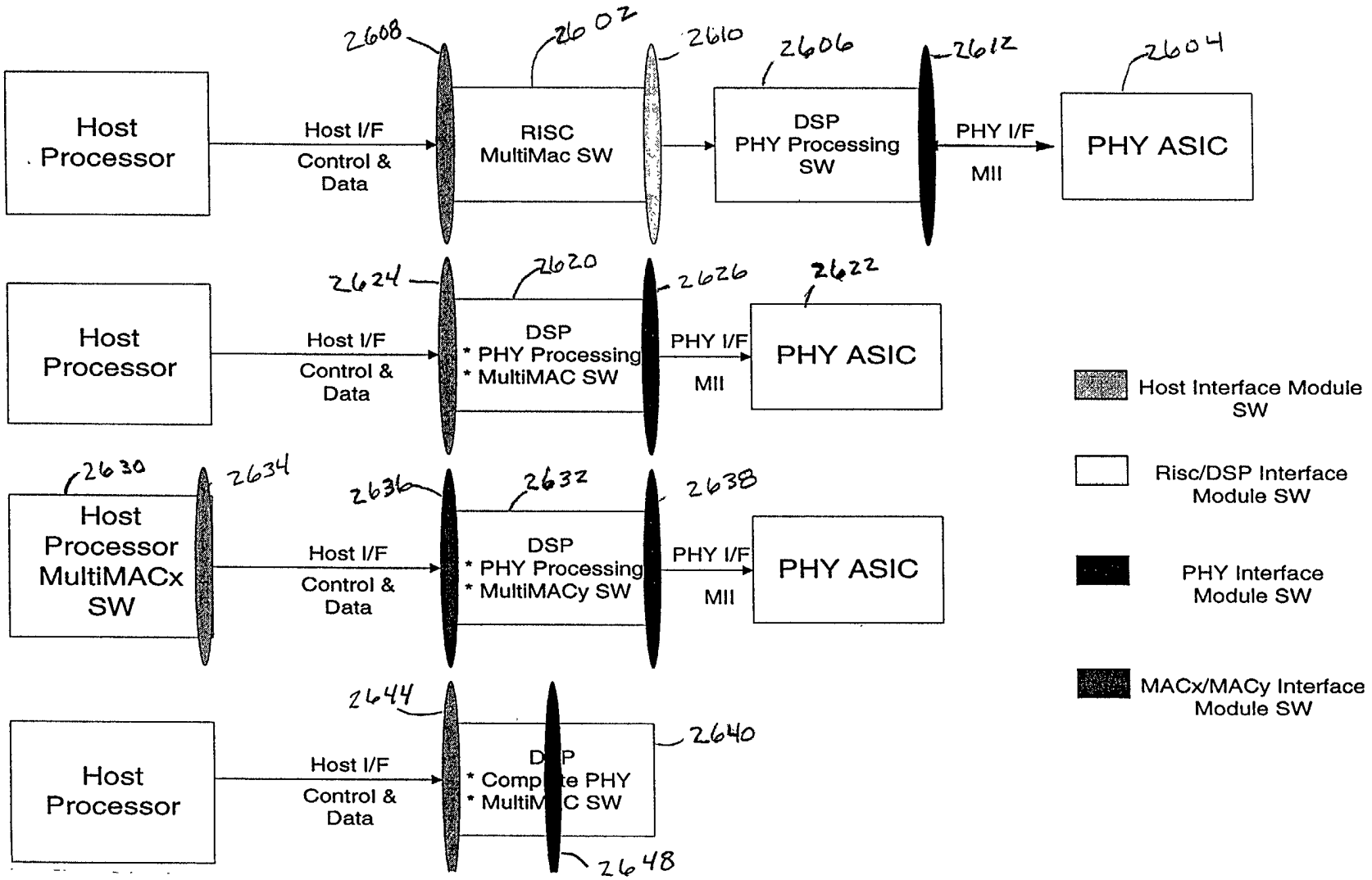
Host Processor
Host I/F
Control & Data
2608
RISC MultiMac SW
2602
2610
DSP PHY Processing SW
2606
2612
PHY I/F
MII
PHY ASIC
2604
Host Processor
Host I/F
Control & Data
2624
DSP
* PHY Processing
* MultiMAC SW
2620
2626
PHY I/F
MII
PHY ASIC
2622
Host Processor MultiMACx SW
2630
2634
Host I/F
Control & Data
2636
DSP
* PHY Processing
* MultiMACy SW
2632
2638
PHY I/F
MII
PHY ASIC
Host Processor
Host I/F
Control & Data
2644
DSP
* Complete PHY
* MultiMAC SW
2640
2648
Host Interface Module SW
Risc/DSP Interface Module SW
PHY Interface Module SW
MACx/MACy Interface Module SW

Figure 23

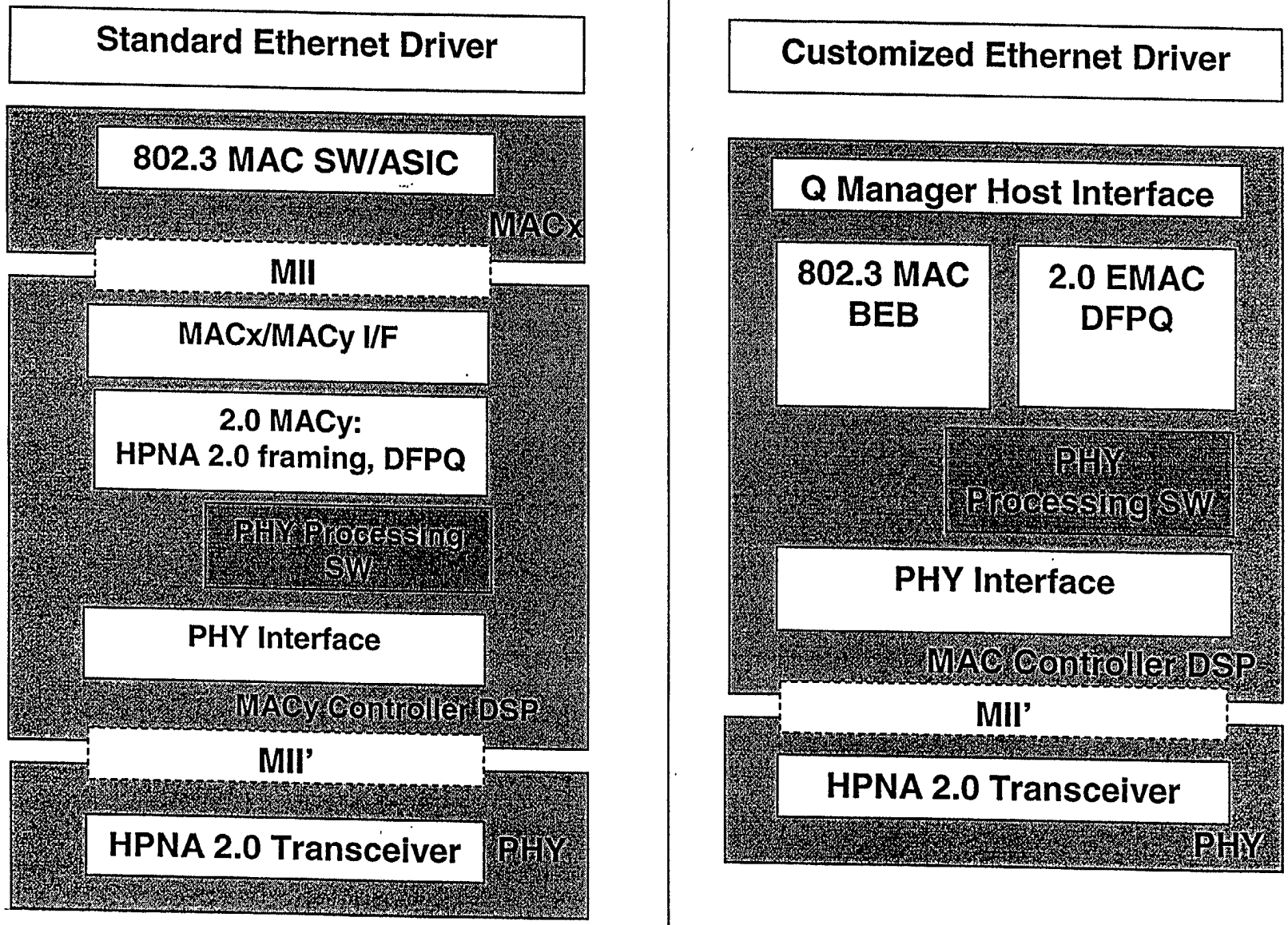
Standard Ethernet Driver
802.3 MAC SW/ASIC
MACx
MII
MACx/MACy I/F
2.0 MACy:
HPNA 2.0 framing, DFPQ
PHY Processing SW
PHY Interface
MACy Controller DSP
MII'
HPNA 2.0 Transceiver
PHY
Customized Ethernet Driver
Q Manager Host Interface
802.3 MAC
BEB
2.0 EMAC
DFPQ
PHY Processing SW
PHY Interface
MAC Controller DSP
MII'
HPNA 2.0 Transceiver
PHY

Figure 24